

---

**DRS-210A/D**

# Single phase two wire DIN rail energy meter

## Two modules



# User manual

1	Safety instructions.....	3
2	Foreword.....	4
3	Performance criteria.....	4
4	Specifications.....	5
5	Basic errors.....	5
6	Description.....	5
7	Dimensions.....	6
8	Torque tables.....	6
9	Installation.....	7
10	Operation.....	8
10.1	Consumption indication.....	8
10.2	Reading the meter.....	8
10.3	Digital register.....	8
10.4	Backlight.....	8
10.5	Mechanical register.....	8
10.6	Pulse output.....	9
11	Troubleshooting.....	10
12	Technical support.....	12

## 1 Safety instructions

### Information for your own safety

This manual does not contain all of the safety measures for operation of this meter because special operating conditions, local code requirements or local regulations may necessitate further measures. However, it does contain information which must be adhered to for your own personal safety and to avoid material damage. This information is highlighted by a warning triangle with an exclamation mark or a lightning bolt depending on the degree of actual or potential danger:



#### Warning

This means that failure to observe the instruction can result in death, serious injury or considerable material damage.



#### Caution

This means hazard of electric shock and failure to take the necessary safety precautions will result in death, serious injury or considerable material damage.

### Qualified personnel

Installation and operation of the device described in this manual may only be performed by qualified personnel. Only people that are authorized to install, connect and use this device, who have the proper knowledge about labeling and grounding electrical equipment and circuits and can do so in accordance with local (safety) regulations, are considered qualified personnel in this manual.

### Use for the intended purpose

This device may only be used for the application cases specified in the catalog and the user manual and only in connection with devices and components recommended and approved by FORLONG.

### Proper handling

The prerequisites for perfect, reliable operation of the product are proper transport, storage, installation and connection, as well as proper operation and maintenance. During its operation certain parts of the meter might carry dangerous voltages.

- Only use insulated tools suitable for the voltages this meter is used for.
- Do not connect while the circuit is connected to a power or current source
- Only place the meter in a dry environment
- Do not mount the meter in an explosive area or exposed to dust, mildew and/or insects.
- Make sure the used wires are suitable for the maximum current of this meter.
- Make sure the AC wires are connected correctly before activating the current/voltage to the meter.
- Do not touch the meter's connection clamps directly with your bare hands, with metal, blank wire or other conducting material as you will risk an electric shock that could cause possible injury, serious injury or death.
- Make sure the protection covers are replaced after installation.
- Maintenance and repair of the meter should only be carried out by qualified personnel.
- Never break any seals (if present on this meter) to open the front cover as this might influence the functionality or accuracy of the meter, and will void all warranty.
- Do not drop, or allow physical impact to the meter as there are high precision components inside that may break and affect the meter measurement negatively.
- All clamps should be properly tightened.
- Make sure the wires fit properly in the connection clamps.
- If the wires are too thin it will cause a bad contact which can spark causing damage to the

meter and its surroundings.

### **Exclusion of liability**

We have checked the contents of this manual and every effort has been made to ensure that the descriptions are as accurate as possible. However, deviations from the description cannot be completely ruled out, so that no liability can be accepted for any errors or omissions in the information given. The data in this manual are checked regularly and the necessary corrections will be included in subsequent editions. If you have any suggestions, please do not hesitate to contact us.

### **Subject to technical modifications without notice.**

### **Copyright**

Copyright FORLONG June 2012. All rights Reserved.

It is prohibited to pass on or copy this document or to use or disclose its contents without express permission of FORLONG. Any duplication is a violation of the law and subject to criminal and civil penalties. All rights reserved, particularly for pending or approved patent awards or registered trademarks.

## **2 Foreword**

Thank you for purchasing this energy meter. forlong has a wide product range of devices. We have introduced a large number of energy meters on the market suitable for 110V AC to 400V AC (50 or 60Hz). Besides the normal energy meters we also developed our own pre-paid meters with chip card, chip card re-loaders and a complete PC management control system. For more information on other products please contact our sales department at : [sale02@china-meters.com](mailto:sale02@china-meters.com)

Although we produce this device according to international standards and our quality inspection is very accurate it's still possible that this device shows a defect or failure for which we do apologize. Under normal conditions your product should give you years of trouble free operation. In case there is a problem with the energy meter you should contact your distributor immediately. Most of our energy meters are sealed with a special seal. Once this seal is broken there is no possibility to claim any warranty. Therefore NEVER open an energy meter or break the seal of the device. The warranty period is 3 years after production, and only valid for production faults.

## **3 Performance criteria**

Operating humidity	≤ 75%
Storage humidity	≤ 95%
Operating temperature	-10°C - +40°C
Storage temperature	-30°C - +70°C
International standard	EN50470-3
Accuracy class	1
Protection against penetration of dust and water	IP51
Insulating encased meter of protective class	II

## 4 Specifications

Meter type	DRS-210A/D
Nominal voltage (Un)	230 V AC
Operational voltage	201~253V AC
Insulation capabilities:	
- AC voltage withstand	4kV for 1 minute
- Impulse voltage withstand	6kV – 1.2μS waveform
Basic current (Ib)	10A
Maximum rated current (Imax)	60/80A
Operational current range	0.4% Ib- Imax
Over current withstand	30Imax for 0.01s
Operational frequency range	50 or 60 Hz ±10%
Internal power consumption	≤2W / 10VA
Test output flash rate (RED LED)	1000 or 2000 imp/kWh
Pulse output rate	1000 or 2000 imp/kWh
Data store	The data can be stored for more than 25 years without power

## 5 Basic errors

0.05Ib	$\text{Cos}\phi = 1$	±1.5%
0.1Ib	$\text{Cos}\phi = 0.5L$	±1.5%
0.1Ib	$\text{Cos}\phi = 0.8C$	±1.5%
0.1Ib - Imax	$\text{Cos}\phi = 1$	±1.0%
0.2Ib - Imax	$\text{Cos}\phi = 0.5L$	±1.0%
0.2Ib - Imax	$\text{Cos}\phi = 0.8C$	±1.0%

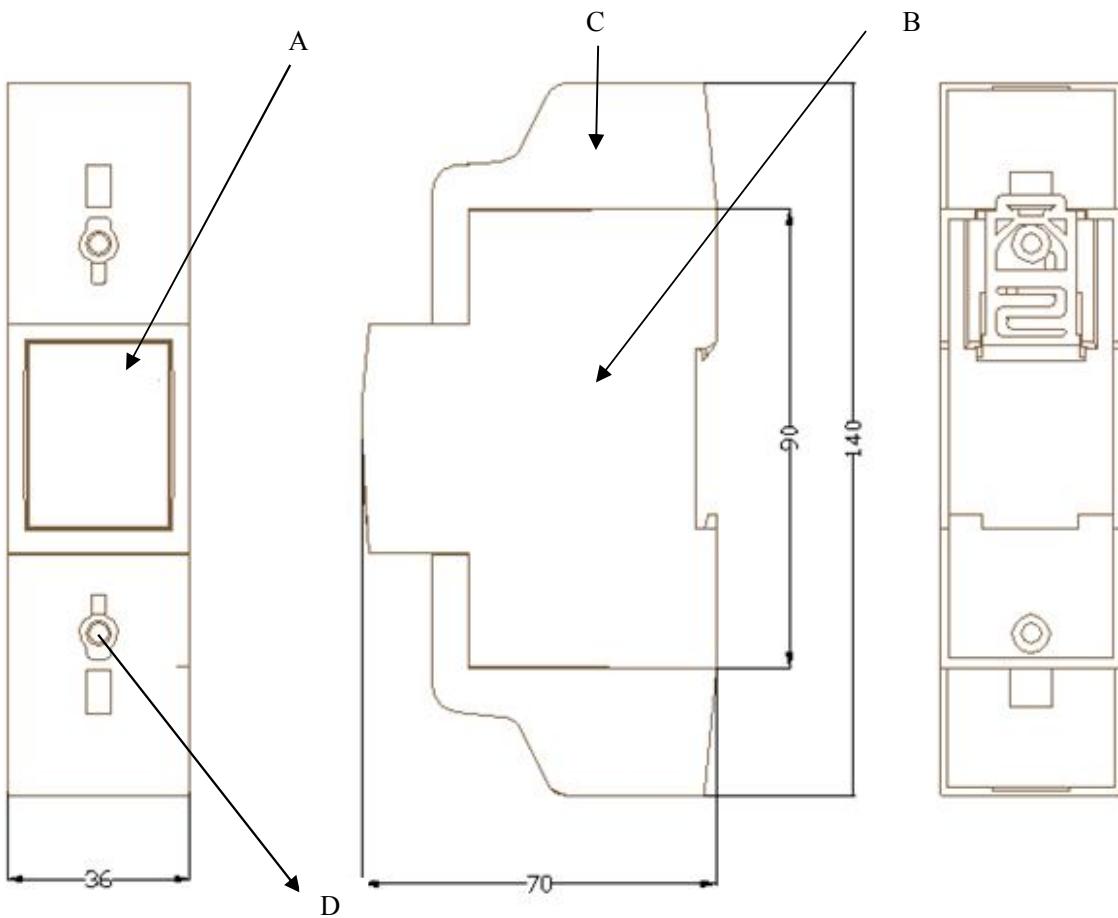
## 6 Description

A	Front panel
B	Base
C	Protection cover
D	Security wire slot

### Material

Front panel	PC inflammable plastic
Protection cover	ABS/PC inflammable plastic
Base	ABS/PC inflammable plastic

**Note: the image might slightly differ from the type you bought.**



## 7 Dimensions

Height	140 mm
Height without protection cover	90 mm
Width	36 mm
Depth	70 mm
Diameter power connection clamps	8 mm
Size of the connection clamps	8 x 8mm
Weight	0.22Kg (net)

## 8 Torque table

Wire type	Screw head	Max wire (mm <sup>2</sup> )	Terminal No	Torque
Phase / neutral	"+"shape/Φ6mm	12	#1 ~ #4	4.60±0.25(Kgf.cm) 0.45±0.025(N.m)
Auxiliary	"+"shape/Φ2.5mm	2,5	#20~#21	1.50±0.25(Kgf.cm) 0.15±0.025(N.m)

## 9 Installation



### CAUTION

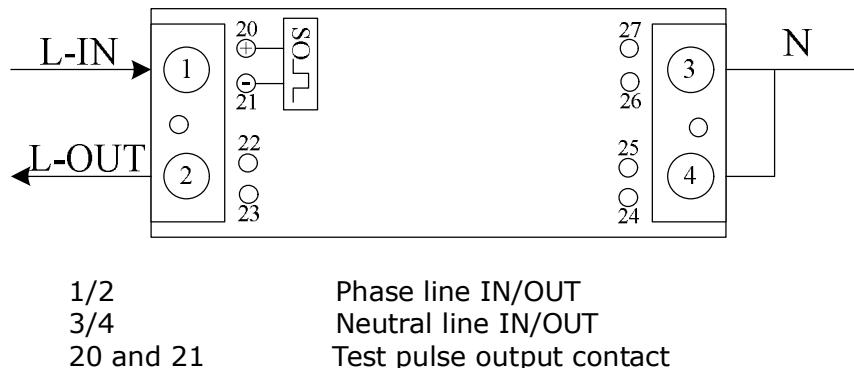
- Turn off and if possible lock all sources supplying the energy meter and the equipment that is connected to it before working on it.
- Always use a properly rated voltage sensing device to confirm that power is off.



### WARNING

- The installation should be performed by qualified personnel familiar with applicable codes and regulations.
- Use insulated tools to install the device.
- A fuse, thermal cut-off or single-pole circuit breaker should be fitted on the supply line and not on the neutral line.

- The connecting wire, connecting the device to the outside circuit, should be sized in accordance with local regulations for the maximum amount of the current breaker or other overcurrent protection devices used in the circuit.
- An external switch or a circuit-breaker should be installed on the supply wires, which will be used to disconnect the meter and the device supplying energy. It is recommended that this switch or circuit-breaker is placed near the meter because that is more convenient for the operator. The switch or circuit-breaker should comply with the specifications of the building's electrical design and all local regulations.
- An external fuse or thermal cut-off used as an overcurrent protection device for the meter must be installed on the supply side wires. It's recommended that this protection device is also placed near the meter for the convenience of the operator. The overcurrent protection device should comply with the specifications of the building's electrical design and all local regulations.
- This meter can be installed indoor, or outdoor enclosed in a meter box which is sufficiently protected, in accordance with local codes and regulations.
- To prevent tampering, an enclosure with a lock or a similar device can be used.
- The meter has to be installed against a fire resistant wall.
- The meter has to be installed in a well ventilated and dry place.
- The meter has to be installed in a protective box if the meter is exposed to dust or other contaminants.
- The meter can be installed and used after being tested and can be sealed afterwards.
- The device can be installed on a 35mm DIN rail or onto a panel with screws.
- The meter should be installed on a location where the meter can be read easily.
- In case the meter is installed in an area with frequent surges for example due to thunderstorms, welding machines, inverters etc, the meter is required to be protected with a Surge Protection Device.
- The device should be sealed immediately after installing it in order to prevent tampering
- Connection of the wires should be done in accordance with the connection diagram as shown below:



## 10 Operation

### 10.1 Consumption indication

There is a red LED on the front panel which displays the consumption measured by the meter. When power is consumed, the LED will flash. The faster the LED flashes, the more power is consumed. For this meter, the LED will flash 1000/2000 times per kWh, see section .

### 10.2 Reading the meter

The DRS-210 series meter can be delivered with either a digital or mechanical register. See the version numbering in section .

### 10.3 Digital register

The energy meter is equipped with a 5+1 digit LCD which is used to record consumption and can't be reset to zero. The display has 5 digits before and 1 decimal after the dot on the display. The reading accuracy is 1/10 kWh. For this meter, the LED will flash 1000 or 2000 times per kWh depending on the version of the meter, see section for details.

### 10.4 Backlight

You have three options to choose from:

1. The backlight is constantly on
2. The backlight is constantly off
3. The backlight turns on when you press the "SEL" button

**Note:** Not every energy meter of the DRS-210A/D series has a backlight. Please check chapter of this manual in order to find out which options your meter has.

In order to set the backlight option you:

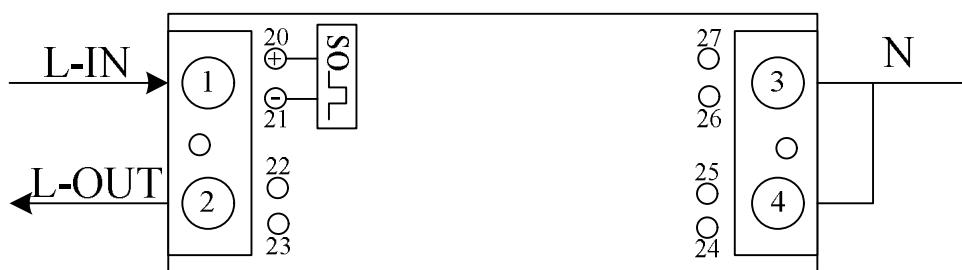
1. press the program button "PRG" for several seconds.
2. the display will show "set"
3. in order to select the right program, press the right button "SEL", so you can go upward or downward (LED1=the backlight is constantly on, LED2=the backlight is constantly off, LED3= the backlight turns on when you press the "SEL" button)
4. in order to save the option you press the left button "PRG". After a few seconds the word "end" will appear in the display.

### 10.5 Mechanical register

The DRS-210A series energy meter is equipped with a mechanical 5+1 register which is used to record consumption and can't be reset to zero. Five decimals have a white text color and one decimal is marked with a red text color. The reading accuracy is 1/10 kWh.

## 10.6 Pulse output

The energy meter is equipped with a pulse output which is optically isolated from the inside circuit. It generates pulses in proportion to the measured consumption for purpose of remote reading or accuracy testing. The pulse output is a polarity dependent, open-collector transistor output requiring an external voltage source for correct operation. For this external voltage source, the voltage ( $U_i$ ) should be lower than 27V DC and the maximum switching current ( $I_{max}$ ) is 27mA. To connect the impulse output, connect 5-27V DC to connector 20 (collector), and the signal wire (S) to connector 21 (emitter). The pulse output is 1000 or 2000 impulses per kWh. See section for details regarding the impulses per kWh



## 11 Troubleshooting



### CAUTION

- During repair and maintenance, do not touch the meter connecting clamps directly with your bare hands, with metal, blank wire or other conducting material as that will cause an electric shock and possibly cause injury, serious injury or even death.
- Turn off and if possible lock all sources supplying the energy meter and the equipment that is connected to it before opening the protection cover and working on it.
- Turn off and lock all power supply to the energy meter and the equipment to which it is installed before opening the protection cover to prevent the hazard of electric shock.



### WARNING

- Maintenance or repair should only be performed by qualified personnel familiar with applicable codes and regulations.
- Use insulated tools to maintain or repair the meter.
- Make sure the protection cover is in place after maintenance or repair.
- The case is sealed, failure to observe this instruction can result in damage to the meter.

Problem	Possible cause	Check/solution
The register doesn't count.	There is almost no load connected to the meter	Check if the red consumption LED is flashing. 100/200 flashes of the LED at 1000/2000 pulses per kWh equals 0.1kWh and should be clearly visible on the display.
	Maybe there is a fault inside the meter.	Please contact technical support for a meter replacement.
No pulse output.	The pulse output is not supplied with DC power	Check the external voltage source ( $U_i$ ) is 5-27V DC with a voltage meter
	The pulse output is not connected correctly	Check if the connection is correct: the 5-27V DC should be connected to the collector connection (pin 20) and the signal wire (S) to the emitter connection (pin 21).
	Maybe there is a fault inside the meter.	Please contact technical support for a meter replacement.
The pulse output rate is wrong.	Maybe there is a fault inside the meter.	Please contact technical support for a meter replacement.
The display is totally off	The meter is not connected to a power source	Are the fuses or/and surge protection defect?
	L1 and N are not connected correctly	Make sure the wires are connected properly and tighten the screws if possible.
	There is no 230V AC between the N and the L connection when power is supplied to the meter.	Check if there is 230V AC voltage between N and the L connection with a voltage meter.  If the checks above don't solve the problem, please contact technical support for a meter replacement.
The consumption red LED is not flashing (PULSE LED).	There is no load connected to the meter. The load on the line is very low.	Connect a load to the meter.  Check with an Ohm-meter if the load value is very low.
	There is a fault inside the meter.	If the checks above don't solve the problem, please contact technical support for a meter replacement.

## 12 Technical support

Any questions, please contact:

Tel: 0086-21-60975591/60975592

Fax: 0086-21-60975593

Email: [sale02@china-meters.com](mailto:sale02@china-meters.com)

[www.china-meters.com](http://www.china-meters.com)



**RoHS**  
COMPLIANT  
2002/95/EC